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## Frameworks for the Future

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# Land Journal



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# FROM THE CHAIRMEN

## ENVIRONMENT & RESOURCES

**Phil  
Rayson**  
FRICS



Members in the Environment & Resources sectors will watch the energy security debate as we move towards the 2015 UK general election.

Fracking is an emotive issue, but it should be viewed in the context of strong regulatory, planning and environmental structures. The article on hydraulic fracturing seeks to lay to rest some of the misconceptions about this technique and its potential uses in the UK. Other carbon-derived sources of energy have a major part to play. The piece on carbon capture and storage brings an updated and not altogether rosy view of this previously much-lauded technique. The piece on the Global Resource Observatory project looks at how shortages in resources can affect the global economy and destabilise entire regions. The article by Frank Byamugisha is a must read for anyone wishing to understand how land grabbing and mineral/resource exploitation can be reined back through the work of land professionals.

The Northern Environment & Resources Conference will again take place in York in April 2014.

## GEOMATICS

**Chris  
Preston**  
FRICS



Building information modelling (BIM) is on everyone's radar and our measurement technologies are the key to an accurate, spatially structured BIM model. This issue features the third article on the BIM-isation of the RICS head office. The RICS BIM Conference ([www.rics.org/bimconference](http://www.rics.org/bimconference)) takes place on 12 February 2014, and the ICES BIM conference (<http://bit.ly/25cices>)

on 25 February. We are also engaged with the UK BIM taskforce and its new working group ([www.bimtaskgroup.org](http://www.bimtaskgroup.org)).

An important diary date is 28-29 May 2014, for GeoBusiness 2014 at London's Business Design Centre. This geospatial event brings together RICS, the Chartered Institution of Civil Engineering Surveyors and The Survey Association. The website ([www.geobusinessshow.com](http://www.geobusinessshow.com)) is open for registration. This issue also contains high-level articles on land administration from two global experts, Frank Byamugisha of the Africa region of the World Bank, and Stig Enemark, former FIG president.

RICS Geomatics is consulting on a couple of important guidance notes: *Boundaries* 3rd edition and *Measured surveys and Land, buildings and utilities* 3rd edition. See you at our forthcoming evening lectures (book at [pgsupport@rics.org](mailto:pgsupport@rics.org); details at [www.rics.org/geomatics](http://www.rics.org/geomatics)).

## RURAL

**John  
Lockhart**  
FRICS



I was delighted to attend the recent Rural Board meeting in Ireland, where fellow Board members and I had the opportunity to invite Rural members to lunch and our afternoon meeting session. We had a particularly lively discussion on the Common Agricultural Policy (CAP), where we face many similar issues. On the subject of CAP, RICS is keeping abreast of developments and has attended meetings of the Defra ministerial stakeholder CAP reform group. At the time of writing, a summary of the latest state of affairs was available at [www.rics.org/rural](http://www.rics.org/rural). Do access the RICS website and the Rural section in particular. Also look out for our monthly professional and technical Rural Practice Update.

Many of you attended the RICS Northern Rural Conference in late October and we are working with RICS Events on a Rural Conference for the South. A date for your diaries is the National Rural Conference on

19 June 2014 at the Royal Agricultural University. These are, of course, complemented by smaller local and regional CPD events. Your Regional Office will have details, but if you feel this is lacking, please contact me directly to discuss.

## PLANNING & DEVELOPMENT

**Paul  
Collins**  
MRICS



In the last issue, I promised to introduce the P&D board and some of our projects. The UK group comprises: former chair Richard Asher, a director at Savills who leads on compulsory purchase matters; Richard Baddeley, who heads up a commercial property consultancy in north Wales and has been leading a study on economic tools that could influence the improvement of troubled town centres; and Kevin Biggs, a property finance director with the Royal Bank of Scotland who led the publication of the guidance note on development appraisal and is our link with the Valuation Standards Board.

Other members include experienced house builder Chris Crook, MD of Kingsgate Property Consultants. He and CBRE Senior Director Jasper Masters have been leading an exploration of the commercial value that good urban design can bring to new residential development schemes. Simon Radford, CEO of London-based Lothbury Investment Management, has led on viability in residential development. Faraz Baber, Executive Director for Policy at London First, sits on the RICS planning policy group. Chris Balch is Professor of Planning at Plymouth University and led the first review of a pre-statutory neighbourhood plan in England. Hannah Bellamy is a development manager for Galliford Try and Ian Lindsay is Land & Property Director for Crossrail.

The board is supported by Land Group Associate Director, Tony Mulhall. Visit <http://bit.ly/pdproff> or feel free to contact me ([paul.collins@ntu.ac.uk](mailto:paul.collins@ntu.ac.uk), 07887 874922) or Tony ([tmulhall@rics.org](mailto:tmulhall@rics.org)).

# UPDATE

## Time is running out



All practising RICS members are required to complete and log at least 20 hours of continuing professional development (CPD) online by 31 December 2013. You may already have completed more hours than you realise, and simply reading this journal counts toward your total. Find out what activities count toward CPD and log your hours before the deadline.

• For more information, visit [www.rics.org/cpd](http://www.rics.org/cpd)

## Over to you

At the recent Rural Professional Group Board meeting, a member enquired of fellow participants: "What is the weirdest thing you have ever valued?" An interesting discussion ensued and the Board agreed it would pose this general question to the wider rural membership. So, if you have ever had to value something out of the ordinary and would like to share your experience, please contact Fiona Mannix ([fmannix@rics.org](mailto:fmannix@rics.org)). We may consider compiling the information we receive (with due permissions), which could make interesting reading.

## Call for papers

The new GEO Business exhibition and conference, taking place in London from 28-29 May 2014 for all those involved in the gathering, storing, processing and delivering of geospatial information, has announced a call for papers with a particular emphasis on the key commercial and technical issues facing the industry. The submission deadline is 29 January. To submit an abstract, go to <http://bit.ly/1afFcWL>. GEO Business, which will also incorporate a programme of live workshops and demonstrations, is supported by RICS, the Chartered Institution of Civil Engineering Surveyors and The Survey Association.

<http://geobusinessshow.com>

## Surveyors' congress

The International Federation of Surveyors' XXV FIG International Congress 2014 will take place in Kuala Lumpur, Malaysia, on 16-21 June 2014. With the theme "Engaging the challenges – enhancing the relevance", the event will bring together an expected 2,000-plus surveyors and land professionals from across the world, and the technical programme will comprise around 700 presentations in more than 100 sessions.

• For more information, visit [www.fig.net/fig2014](http://www.fig.net/fig2014)

## Expert witness guidance

The consultation has ended on the draft practice statement and guidance note *Surveyors acting as expert witnesses* (4th edition), bringing together and updating the 2009 3rd edition and two subsequent addenda. The guidance note sets out duties and procedures involved and provides clear guidance on the statement of truth and declaration that must accompany written reports made by chartered surveyors acting in the capacity of an expert witness.

## Changes to regulations

The Renewable Heat Incentive Scheme (Amendment) (No 2) Regulations 2013 came into force in September. They amend the 2011 regulations to introduce new requirements relating to emissions from plants generating heat from solid biomass, new metering provisions, and make other incidental and miscellaneous changes.

The Town and Country Planning (Marine Fish Farming) (Scotland) Regulations 2013 were due to come into force on 8 November 2013. These replace and revoke the 2007 Regulations and set out how an application for the operation of a marine fish farm is to be made to the Scottish Ministers under section 31A of the Town and Country Planning (Scotland) Act 1997.

## BIM Manager Certification

RICS has developed the first building information modelling (BIM) Manager Certification in response to industry need for a universal standard on which to assess the skills of construction professionals in using BIM. The new certification will give assurance to contractors, consultants and investors that the professionals and firms delivering construction and infrastructure projects have the knowledge and experience to implement BIM at a tested, approved level. All applicants must have five years' experience in a relevant sector, MRICS, AssocRICS, any degree or a recognised professional qualification, and 12 months of practical BIM experience, either in cost estimating or construction.

• For more information, applicant guides and forms, visit <http://bit.ly/managbim>

## Career in farming?

The first dedicated website to inspire talented young people to consider the array of career opportunities in farming and food supply has been launched. The site aims to inspire positive perceptions of agriculture and its associated sectors ([www.brightcrop.org.uk](http://www.brightcrop.org.uk)).

Bright Crop and STEMNET are building a network of Bright Crop STEM Ambassadors. Professionals wishing to volunteer for this role may sign up via the website (click on 'Information for industry').

• Email [info@brightcrop.org.uk](mailto:info@brightcrop.org.uk) or call 020 7566 8692 for more information





# Liquid assets

As with any investment in rural land, the purchase of a vineyard requires due diligence, careful planning and sound surveying, financial and legal advice, says **Guy Hurst**

**E**nglish wine growing is not a new phenomenon. The Romans introduced it into England and at the time of the *Domesday Book* there were 40 recorded vineyards in the country, mostly producing communion wine. When Henry VIII succeeded to the throne in 1509 there were 139 vineyards recorded, 11 owned by the crown.

Subsequently, production declined due to the vagaries of disease and the abolition of import tax, and it was not until the 1930s that vines were once again planted in the south of England. But the real growth and investment has taken place in the past 30 years. There are currently around 448 commercial vineyards in England and Wales, with a further 89 classified as 'hobby vineyards' because their production is not sold or recorded.

While there is no doubt that any farming is hard work, many prospective owners are attracted to running a vineyard because it does not involve livestock, they are less reliant on supermarkets that can drive down prices and, of course, there is a certain amount of sophistication and glamour attached. I am sure we have all driven through parts of France and been seduced by the lifestyle.

Vineyards and land suitable for growing vines are not in short supply, but they do not often come up for sale on the open market. When they do, they can attract significant interest, particularly along the south coast

where investment in recent years has not just come from UK buyers but also from overseas interests. Some of this speculative buying of land is rumoured to be the champagne houses of France hedging their bets against global warming, but the majority of buyers are looking to produce wine commercially as soon as possible.

Once established, production volumes can vary considerably because of the unpredictable British weather. For example, 2012 saw the lowest volume of English wine produced since 1997, with reports of entire crops scrapped by some vineyards. On the other hand, 2010 recorded the highest production of English wine: four million bottles.

## Costly investment

In any event, investing in a commercial vineyard by purchasing an established business or by buying farmland and starting from scratch is a costly affair and certainly not for the fainthearted.

Given the upfront costs and the fact that with a new venture you may have to wait four or five years before commercial wine production can begin, it makes sense to look at buying an existing vineyard with a view to increasing its production over time. The benefit is the same as buying any established business. Someone has already done a lot of the hard work and the infrastructure, including the vines, will be in place. This means that you can begin production the following harvest or sell existing stock to provide an income.

## Red tape

Your accountant and solicitor will go through the process of due diligence in the same way as when purchasing any business and will advise you on the accounts, the business assets, supplier agreements, employment contracts and other matters associated with the enterprise. An existing business will also have an identifiable name and may have its own market, locally or nationally, and many vineyards are on the tourist trail for passing trade. The downside is that for the foreseeable future you have to live with the varieties that are already planted and the previous growing systems and processes. You will also have to make do with the existing site. While there may already be buildings, they may be too small to accommodate your longer-term ambitions, or the whole operation may not be laid out as you would prefer.

An alternative is to buy an existing farm or estate and plant your own vines, although you will have to be prepared to wait several years to find out whether the grapes will produce anything half decent. Once you have identified a suitable site, work can begin in earnest and costs will start building up. With the price of arable land currently at an all-time high, the purchase of the land will be not insignificant, and added to this will be the cost of soil analysis, environmental impact assessments, planning consent and building processing plants/bottling plants, visitor centres and accommodation for





both permanent and seasonal staff. All in all, the cost of setting up a vineyard from scratch can be astronomical.

Your solicitor should approach the purchase in the same way as any farm or agricultural estate, but taking into account the unique nature of growing vines, not forgetting that viticulture is classed as agriculture.

The usual searches and investigations should be carried out. In the context of growing grapes, these can throw up some quirks, which in the ordinary course of buying a farm would not raise an eyebrow. For example, I recently acted for a client who bought several hundred hectares of the south of England with the aim of establishing one of the largest vineyards in the country, but part of it was subject to restrictive covenants limiting the use of land on some of the all-important south-facing slopes to grassland for the grazing of sheep and cattle.

In the context of buying a stock farm, this restriction on land that is too steep to take a combine harvester would not normally have warranted a second thought, but it was vital to have it lifted for the long-term future of the vineyard and the business. Happily, a solution was found to everyone's satisfaction.

## Planning

One of the major hurdles for any rural business is the planning process. It is important to ensure that the correct planning consent is in place for any buildings and that their use is not restricted in a way that is incompatible with the process of growing vines and producing wine. If the buildings are listed or the farm is

in a conservation area, national park, area of outstanding beauty or site of special scientific interest, there will be tougher rules on planning, building and the impact the proposed business may have on the area. These will all have to be borne in mind.

If that attractive range of flint-faced traditional buildings that would make an ideal visitor centre is listed, then this may severely curtail the plans you had for them. In all likelihood, any initial timescale given for carrying out an extensive building programme will be exceeded, as will initial cost estimates, although these can be minimised by employing an experienced surveyor to oversee the project.

There may be site access issues, relating to the visiting public, deliveries, and so forth. These will have to be addressed. Traffic on rural roads can often generate bad feelings between local residents and the business operator and these may be taken into account when after a few years, flushed with success, you seek to expand the business.

## Public right of way

It is also essential to check what rights the public may have over the farm you are considering buying. A footpath across a field of wheat is seldom an issue, but through a vineyard is a different story. It can be difficult and costly to re-route a public right of way and if part of the farm is classified as 'access land' under the 'right to roam' provisions of the Countryside and Rights of Way Act 2000, will you really appreciate members of the public having the right to enter and remain on your vineyard for recreational purposes? If part of the property is common land, you must

ensure that your activities do not in any way interfere with commoners' rights.

Particular attention should be paid to utilities that may cross the land. Wayleave agreements or easements may allow the growing of arable crops on the easement strip, but does that underground line running slap bang through the middle of the vineyard allow deep rooting vines to be planted or trellising posts to be put in?

Consideration should also be given to the nature in which the vineyard will be owned – whether as a partnership, limited company or other such vehicle. As with all such transactions, specialist tax advice should be sought at the outset.

There is no doubt there is a real passion for English wine. English sparkling wines continue to win prestigious awards, consistently beating well-known French champagne houses, yet the sales of English and Welsh wines combined still only account for about 1% of the domestic market.

There is ample scope for production to increase; therefore, strong demand for suitable land for vineyards looks set to continue. But the end price of the bottle of wine with a consistent quality needs to be able to compete commercially, and this is often the challenge. Before embarking on the significant expenditure required, make sure you do your own homework and take the expert legal advice that should always be sought before buying any property or land. ●

*This article is not intended to be a full summary of the law and advice should be sought on all issues.*

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After qualifying as an investment surveyor some 27 years ago, it was natural that my attention would be drawn to the centres of real estate investment, above all the City of London, where the demand for space sees maximum use of every conceivable rentable corner. While the sophistication of the city is interesting and fun, I dreamt of a place where it might be possible to work in an investment environment that matched the power of the City with the tranquillity of the countryside.

The Bordeaux vineyard market is just such a place. There are vineyards, not for sale I might add, that were we to value them would probably start at half a billion euros. We have seen sales at €4m per hectare and offers refused at €7m per hectare. I speak, of course, of the investment grade *Première Grand Cru Classé* wines and those vineyards designated under the Bordeaux classification of 1855.

### Trading region

The city of Bordeaux became a powerful merchant trading area in the 14th century thanks to its strategic waterways and natural port with access to the Atlantic. By the 19th century, wine had become its core export. But the first known vineyards date back about 2,000 years and it was the Romans who most likely identified and exploited the natural environment and climate so well suited to wine



# Surveyors among the vines

**Michael Baynes** looks at the unique issues of valuing vineyards

growing. Bordeaux is the world's largest wine region: there are approximately 126,000ha of vines there, all pruned by hand.

Bordeaux has 57 wine appellations (think Heinz!), 8,000 wine-producing *châteaux* and 13,000 grape growers. With an annual production of approximately 850 million bottles, Bordeaux produces large quantities of everyday wine as well as some of the most expensive wines in the world, which combined creates an industry of some €14.5bn a year.

### Vineyard market

Yet the vineyard market is small, discrete and, excuse the pun, illiquid. In London, there might be single streets in Chelsea that see 35 transactions in a year; there were a total of 35 vineyard transactions in Bordeaux in 2011 and the SAFER reports a total of 37 for 2012. This number will increase for 2013 with the continued strong interest from China, but at any given time there are rarely more than 80 *châteaux* estates on the market for sale. Furthermore, the sales process is slow and fraught with complications and exceptions.

### How to value a vineyard

Maxwell-Storrie-Baynes was invited to the Bordeaux business management school, Inseec, in February 2013, to lecture the Masters of Wine students on how to value a vineyard. I went through a case study valuation before having the students complete a valuation of a hypothetical estate themselves.

They were surprised to learn that the income stream from a vineyard is not valued in the same way as many other businesses or commercial real estate. With the vast majority of businesses there is an exit strategy envisaged and the accounts are organised to demonstrate a steady rise in revenue to impress the target for the exit after a certain number of years.

But with Bordeaux vineyards it is very rare, particularly in the lower end of the market under €20m, to see a normal business/exit strategy being pursued by owners. The vast majority of owners run the vineyard as a family business and intentionally follow a strategy of tax minimisation while at the same time maximising the French

government's financial support for farm operations.

At university I was taught to look at the income stream from the real estate and then apply a year's purchase capitalisation multiplier to arrive at the valuation. But the vineyards' income stream is very hard to discern from the accounts as outlined above, and also from the rental stream. The ownership structure is commonly held in two companies, with a commercial company renting from an agricultural holding company. Since the ultimate owner is the same, the rental agreement between the two is not at market rates and is purely a strategic manoeuvre.

In this way, when valuing vineyard properties we place no value on the investment value or 'goodwill' of the business and income stream. We do not take the net operating income and apply a cap rate multiplier; instead, we value the assets only, and if there has been a legitimate reason for poor performance in recent years, we apply a discount to asset value accordingly. The skill of the valuation therefore entails a detailed understanding of each

composite part of the whole. Each asset part is therefore broken down to its unit size; square metres for building and hectares for the land surface.

Depending on the condition and amenity of the buildings, the appropriate multiplier is applied. For example, a well presented *château* residence of 400m<sup>2</sup> might be valued at €3,000/m<sup>2</sup> = €1.2m. In the same way a multiplier is applied to the chai (storage sheds for casks), offices, tasting rooms, barrel storage, bottle storage rooms and equipment garages, each one different.

Likewise with the vines, each parcel is analysed on the basis of its plant density, age, condition, aspect, ventilation, soil and drainage. These qualities will place the vines' value within the range for a given appellation. For example, a Bordeaux Superieur within the Entre-deux-Mers region will have a value range of €12,000 to €30,000 per hectare. The strength of these qualities will determine where the valuer positions their final value on a parcel-by-parcel basis. Other influences will be the notoriety of the wine, its prizes and press strength,

strength of sales contracts and marketing brand.

There may be some of the vineyard's parcels closer to the lower end of the range and others in the middle or at the top end depending on their strengths and weaknesses. Finally, the vineyard valuation will review the materials and equipment for farming and making the wine. Their age and condition will be significant factors and the company accounts will list all of the equipment owned by the estate.

### The UK market

The Bordeaux vineyard market has in many respects followed the fortunes of its wine market. While the investment-grade wines have behaved like luxury goods, the vast majority of Bordeaux wines have had to adjust to the arrival of some very competent offerings from elsewhere in the world, including Chile, South Africa, Napa Valley (California), Australia and New Zealand. Perhaps the most surprising newcomer to the world of modern wine making is the UK itself, which in the past 10 years particularly has seen some interesting if not highly

technical wines winning accolades and praise.

Maxwell-Storrie-Baynes in Bordeaux is affiliated through Christie's to Strutt & Parker in the UK, which is one of the leading experts in the emerging UK vineyard market. Our new initiative together, named Vineyards by Christie's, brings the foremost vineyard experts from around the world together to advise on this nuanced area of real estate investment. I asked my associate from Strutt & Parker, Nicholas Watson, to comment on what he is observing in the UK vineyard market.

The UK has been largely populated by 'hobby' vineyards, often attached to an impressive house. The vineyards are not commercial ventures and in most cases the vines are managed by the owner as a hobby or under contract by a wine producer, thereby separating production from location. While Bordeaux has a very mature and ancient vineyard market, the UK is so young that there are very few comparables on which to base valuation evidence. This is further compounded by the embryonic nature of the industry, which has perhaps half a dozen serious businesses in the whole country. Watson explains: "Most vineyards are not profitable ventures, so if their value is acknowledged at all, it is simply as an amenity to the country house that is the principal focus of value."

Through Strutt & Parker, Watson acts on behalf of some of the most significant wine estates in the UK. Of particular note, he says, is the focus on sparkling wine products. Like the Champagne region, there are parts of southern England (Kent, Sussex and Hampshire) that have 'terroir' and climatic conditions that are very well disposed to sparkling wine production. The market leader, Nyetimber, is one of Watson's clients and is taking a significant share of the UK market, but

as he points out: "Domestic demand for high-quality English sparkling wine continues to outstrip supply, but as supply increases the challenge for English producers is to compete in the international market place and establish a reliable export market."

### The AOC system

Of course I am biased, I admit it, but to my mind there will never be another Bordeaux and no other region in the world can match its depth of knowledge, history and suitability for the growing vines. But above all, and the thing that will always distinguish it from other wine-growing regions, is the Appellation d'Origine Contrôlée (AOC) system imposed on anyone that wishes to state that they are making a true Bordeaux wine. While irrigation is standard practice in Chile, the USA and Argentina, for example, I bet you did not know that irrigation is illegal in Bordeaux. What makes each Bordeaux vintage unique is the winemaker's interpretation of the sun, the rain, the frost, the soil, the drainage, the plants' grape variety and what the market wants. This is what underwrites the Chinese interest in Bordeaux, and this, in my opinion, is what underwrites Bordeaux's long-term future as a world leader in wine. ●



#### Further +info

Related competencies include **T049**, **T083**



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A flexible approach to building spatial frameworks in terms of technology and investment choices is urgently needed. **Stig Enemark** explains

# Frameworks for the future

Most developing countries have a cadastral coverage of less than 30%. Systems normally operate with the Western procedures for surveys and land registration introduced in colonial times, and do not recognise more informal, social or customary types of tenure. So, more than 70% of the land in many developing countries, such as the sub-Saharan region, is generally outside the formal land administration system (LAS). This causes enormous problems both in cities, with increasing populations of slum dwellers, and in rural areas with regard to food security and land management issues. Building the spatial frameworks in developing countries is a major challenge – and fundamental for establishing systems to support sustainable and transparent land governance.

## Global perspective

LAS provides a country with the infrastructure to implement land-related policies and management strategies. It is not a new discipline but has evolved out of the cadastre and land registration areas with specific focus on security of land rights. The need to address land management issues systematically pushes the design of LAS towards an enabling infrastructure for implementing land policies. Such a global land administration perspective is presented in [Figure 1](#).

A modern LAS encourages integration of the processes related to **land tenure** (securing and transferring land rights), **land value** (valuation and taxation of land), **land use** (planning and control of land use) and **land development** (implementing utilities, infrastructure and construction planning). The four functions interact to deliver overall policy objectives and are facilitated by appropriate land information infrastructures that include cadastral and topographic datasets linking the built and natural environment. Ultimately, the design of adequate systems of land tenure and value should support efficient land markets capable of supporting trading in simple and complex commodities.

Figure 1

A global land administration perspective [Williamson *et al* 2010]

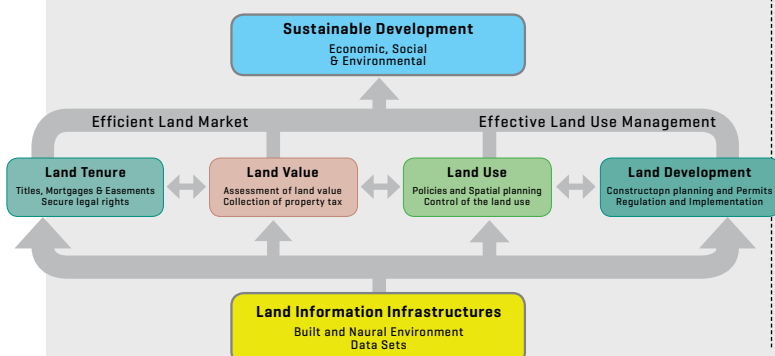
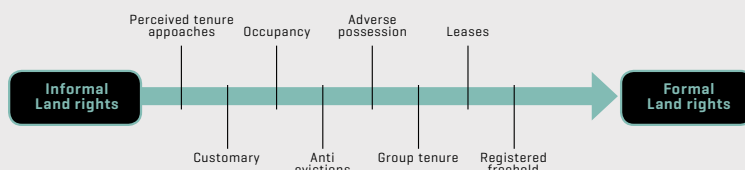


Figure 2



## Spatial framework

The spatial framework – basic large-scale mapping showing the way land is divided for specific use and possession – provides the basis for dealing with land administration functions (e.g. recording and management of legal and social tenure, assessment of land and property value and taxation, identification and management of current land use, planning for future land use and development, delivery of utility services, and administration and protection of natural resources). The framework should be linked to the national grid through a positioning infrastructure based on the global navigation satellite systems, so that maintenance, updating and upgrading can take place when needed. Also, the framework may well include information volunteered by citizens, through crowdsourcing. When considering the resources and capacities required for building such spatial frameworks in developing countries, Western concepts may well be seen as the end target but not as the point of entry.


## Social tenure

Formal Western systems do not serve the millions of people whose tenures are predominantly social. The social tenure domain model (STDM) recognises land rights as a continuum ranging from informal to more formalised stages (see [Figure 2](#)), even though this process does not mean that all societies will necessarily develop into freehold tenure systems.

The STDM concept focuses on the relationships between parties (tribes, people, villages, governments), social tenure relations (formal, informal, customary or even conflicting people-land relationships), and spatial units. The UN Food and Agricultural Organisation (FAO) voluntary guidelines on responsible governance of tenure place tenure rights in the same context as the rights to adequate food and housing. The guidelines can help various parties determine whether proposed actions constitute acceptable practices.

## Continuum of accuracy

The spatial framework should be developed using a flexible and fit-for purpose approach rather than being guided by high-tech solutions and costly field survey procedures. Accuracy can then be improved over time. Such a fit-for-purpose approach could be referred to as a 'continuum of accuracy'. The key focus should be on providing secure land rights for all, and managing the use of land and natural resources for the benefit of local communities and society.

 Boundary surveys in Malawi


## Fit for purpose

Fit for purpose means that the framework should be designed to manage current land issues within a specific country or region, rather than following more advanced technical standards. The land administration functions may put different requirements on accuracy, which may vary depending on geography and density of land use. Security of tenure does not in itself require accurate boundary surveys – the important aspect is identification of the land object with its legal or social right. The accuracy required for planning and management of land use also varies considerably. The scale of the framework depends on topography and density of development and may vary from large-scale mapping in dense urban areas to minor scale images in rural and remote regions. Accurate surveys of property boundaries may be justified in high-value urban areas.

There are four key principles of a fit-for-purpose approach for developing the spatial framework:

**General boundaries** Using general boundaries will suffice for most land administration purposes, while fixed boundaries (monuments and surveyed) will contribute to interoperability between legal and physical objects in advanced LAS and also to reducing boundary disputes to some extent. Fixed boundaries can be used where relevant or necessary, or when required and paid for by landowners or stakeholders.

**Satellite images/orthophotos** Using large-scale satellite images (e.g. 50cm resolution) or orthophotos will suffice for most land administration purposes. In most cases, boundaries can clearly be identified. People can generally easily read the images, making it simple to apply a participatory approach to boundary determination. Non-visual boundaries can be added using hand-held GPS or field-survey measurements. Using satellite images/orthophotos are far cheaper than field survey and does not require trained professionals to undertake field work. Mapping methodology using satellite images/orthophotos also provides general topography of land use, buildings and infrastructure.

**Accuracy relating to purpose** Accuracy of information such as parcel boundaries is relative to the use of the information, while technical standards are often inflexible. The registration of legal and social tenure rights requires identification of object, but the process in itself does not call for high accuracy. Also, planning and land development processes mainly require sufficient mapping for identifying physical and spatial objects rather than high accuracy. Any demand for accuracy may stem

from issues such as high land value in dense urban areas or implementation of costly construction works.

**Opportunities for updating** Building the spatial framework should be seen as an opportunity for ongoing updating, sporadic upgrading and incremental improvement whenever relevant or necessary for fulfilling land policy aims and objectives. This, of course, requires that mapping and surveys are linked to a national grid system. Ongoing updating is a must to ensure that data is complete and reliable and that the investment is not wasted over a relatively short period. The opportunity for upgrading is essential and allows for map base improvement when needed for specific purposes, such as land development or major construction and infrastructure works. This incremental improvement will, in turn, establish a spatial framework in line with modern, fully integrated LAS.

## Conclusion

In most developed countries, spatial frameworks were developed over time in response to societal, institutional and technological developments. Building the framework in developing regions should reflect current societal needs and available economic resources.

Professional codes support the existing systems, and there are many examples of resistance to change that will challenge their position. On the other hand, by including all land in formal LAS, land professionals will contribute to social development and, at the same time, also enlarge their functions and clientele. The key benefit of a fit-for-purpose approach would be that all land could be included in the formal LAS in a reasonably short time and at a relatively low cost. ●

## More information

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The full *Fit for purpose: building spatial frameworks for sustainable and transparent land governance* research paper was presented at the Annual World Bank Conference on Land and Poverty, April 2013 (<http://go.worldbank.org/RTWVJ20A20>; <http://bit.ly/lasfit>). A short version was published in *GIM International*, July 2013.

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**Further +info**

Related competencies include **T007, T057, T072**





Surveyors and other land professionals can play a vital role in improving land governance in Africa, which is critical to unlocking the continent's potential, says **Frank FK Byamugisha**

# Making an impact

**I**mproving land governance and ending extreme poverty within 10 to 20 years is not an insurmountable challenge if key stakeholders work together to scale up successful innovations and adopt global best practices. A World Bank report launched in mid-2013 proposes how to do this via a 10-point, US\$4.5bn programme of reforms and investments to be implemented over 10 years.

The International Federation of Surveyors (FIG) Working Week in Abuja, Nigeria, in May 2013 presented an opportunity to reflect on FIG's achievements since its establishment in 1878. While extending its global outreach to 120 countries, FIG has set and maintained high professional standards globally within its membership. The week also presented an opportunity to reflect on the development of sub-Saharan Africa. Africa's economies have been going through a period of unprecedented growth. Excluding South Africa, which grew at 3% in 2012, sub-Saharan Africa grew at 5.8% per year, consolidating more than a decade of growth at rates above 5% per year.

World Bank projections indicate that sub-Saharan Africa will continue to grow at about 6% per year for the next three years (except for South Africa, with projected growth of 3%), while the global economy is expected to grow at only 2.4%. In other words, the region is projected to grow twice as fast as the global economy.

## Poverty remains a challenge

The greatest challenge to mankind today is the 1.2 billion people (about 22% of the population in the developing world) living in extreme poverty, on less than US\$1.25 a day. One-third – 400 million – are in sub-Saharan Africa, with nearly one out of every two Africans living in extreme poverty.

The strong economic growth of the past decade has reduced poverty in the region (from about 58% to 48%), but at a substantially slower rate than that achieved in other parts of the world. The main reasons for this are inequality and dependence on natural resources, especially oil and minerals. Growth has not produced jobs, and oil and minerals revenues have not been spent on the poor. Agriculture and manufacturing, the labour-intensive sectors that normally produce jobs, have not participated in this growth, except in a few countries.

To break this nexus, two critical actions are required: spending revenue from oil and

minerals on people-centred investments such as education, health and nutrition, and encouraging growth in the sectors that generate jobs and incomes for most of the population, particularly agriculture. This article focuses on the latter, because it is more relevant for the majority of African countries and an area where surveyors and other land professionals can more readily make a difference.

## Unlocking potential

Agriculture is the sector in Africa that produces the most jobs, providing a livelihood to 70% of the population. Growth in agriculture translates to a greater reduction in poverty than in other economic sectors. The challenge is to boost agricultural productivity on cultivated land and to put into production the vast amount of unused land. Agricultural productivity in Africa is about 25% of its potential: yields of the staple food maize stand at about 20% of that achieved at research stations. There is

still a lot of room for the sector to become a key driver of income and job growth, and even more room to boost incomes from uncultivated land. Of the remaining and usable uncultivated land worldwide, 202 million hectares (47% of total uncultivated land) are in sub-Saharan Africa.

Africa needs to invest substantially more in agriculture. Such investment has historically been low, but since around 2008 several factors have led to increased interest from investors to acquire land for large-scale agriculture globally. Two-thirds of the land acquired have been in Africa, prompting some to call it the 'new scramble for Africa'. This has become a bigger issue in Africa than in other regions because about 90% of rural land on the continent is undocumented, and such land is vulnerable to land grabbing and to expropriation with little or no compensation. Documentation of land is critical not only to protect communities, but also to provide security to investors. Increasing communities' bargaining power to reach win-win agreements is good for investment. In turn, increased investment and local participation are good for agriculture, the economy, employment and incomes,

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The challenge is to boost agricultural productivity on cultivated land and to put into production the vast amount of unused land



yielding a considerable impact on reducing extreme poverty. This is where land surveyors, other land professionals and FIG can best contribute professionally.

### Accelerating land documentation

If Africa has documented less than 10% of its rural land in the past 50 years and worldwide only about 25% of total land is recorded, is it really feasible to document the remainder of Africa's rural land in the next decade or two? And the challenge extends to urban slums, home to 70% of Africa's urban population. I believe the

answer is yes, if we are strategic and focused. Expedited documentation of land is an area where surveyors and other land professionals can make a real difference, but we must change the way we do business, serving more people and accomplishing more with less, in a much shorter time than we have done in the 135 years since FIG was founded. We must learn from contemporary land administration reform and act on recent lessons.

China and Vietnam provide relevant examples. China in 1978 and Vietnam in 1988 dismantled their collective farms and

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Documentation of land is critical not only to protect communities but also to provide security to investors

used long-term leases to allocate land rights to farming households. In China, this launched an era of prolonged agricultural growth that transformed rural China and led to the largest reduction in poverty in history – the percentage of people in extreme poverty declined from about 80% in 1981 to only 13% in 2008. Vietnam's land reform also engineered remarkable agricultural growth and economic transformation in the past two decades, reducing extreme poverty from 58% in the early 1990s to 14.5% in 2008.

The land tenure reforms introducing long-term leases in China and Vietnam were not accompanied by use of spatial frameworks or cadastral mapping to delineate household land. In fact, Vietnam only started developing a spatial framework for rural land holdings about five years ago, while China is only now starting to do so using satellite imagery. So, both allocated land rights without a spatial framework, and certainly not based on detailed boundaries surveys. Similarly, when Thailand developed its Land Code in 1954, it provided for recognition of a continuum of rights, with seven categories of land rights recorded using spatial frameworks of varying degrees of detail, from doing without a cadastral map (not even a sketch) to using orthophotos to ultimately using cadastral maps based on detailed surveys of boundaries.

England and Wales have long used the general boundaries rule to document rural land using large-scale base maps. In Africa, significant progress in this direction has been made in the past 10 years. From 2003 to 2005, Ethiopia issued land use certificates for 20 million land parcels without even a sketch map. In June 2012, Rwanda completed a country-wide programme to adjudicate and demarcate 10.3 million land parcels mainly using





► orthophoto maps. These programmes, combined with other agricultural and economic interventions, have done wonders for their economies. Both countries have grown at 8%-10% per year in the past half-decade, with Ethiopia reducing extreme poverty from more than 40% to 30% in the last 10 years and Rwanda from 55% to 40%.

Other African countries are following in their footsteps. Nigeria, Tanzania, Uganda, Mozambique, Namibia, Madagascar, Benin, Côte d'Ivoire and Burkina Faso have land legislation that permits flexibility in measuring rural land boundaries.

### Different, faster action

To expand on these successes, land professionals must lead the way, moving away from rigid surveying standards and technologies to more flexible ones that meet today's needs while anticipating those of tomorrow. Relevance, not accuracy, has to be the guiding principle, and we must take advantage of modern technology.

A growing number of people are already advocating these ideals. Stig Enemark (see [p10](#)) calls it 'spatially fit for purpose', Robin McLaren calls it 'crowd-sourcing', Barry, Molero and Muhsen call it the 'talking titler' (See [More information](#)), while the Global Land Tool Network calls it a 'social tenure domain model' (UN-Habitat 2008). Common to all is the desire for simple, affordable, fast and community-supported approaches to designing spatial frameworks and to recording land rights and related information. The initiators are social innovators and we should work with them to test and appraise these initiatives and other investments and technologies to ensure that they are technically, economically, socially and environmentally sound to meet society's needs. The bottom line? We need practical, bold new solutions

to document the land rights of billions of people in rural areas and urban slums to get them out of informality and extreme poverty.

We must deal with educational and research institutions to ensure that curricula for surveyors and other professionals move away from serving only a few people with over-engineered, costly solutions and instead be able to serve the masses, to recognise a continuum of land rights, and to focus on recording rights quickly and cheaply. The organisation of work in ministries of lands, land commissions, and survey and mapping agencies must also change, and transformation must reach suppliers and service providers, such as consultancy firms, and advocacy groups and development partners.

### Global best practice

Surveyors and other land professionals must champion this change, modernising and simplifying surveying and mapping regulations to take advantage of modern technology to do things faster and cheaper. We should pilot new innovations, scale up global best practices and successful pilots and learn from the experiences of China, Vietnam, Thailand, Ethiopia, Rwanda and many others. The World Bank is prepared to support sound land governance with policy reforms and investments. Its US\$4.5bn programme on improving land governance in sub-Saharan Africa will include not only documenting land rights but also increasing land access for the poor, increasing land administration efficiency, developing land administration in post-conflict countries, developing capacity, resolving land disputes, improving land use planning and management of public land, and strengthening property valuation and land tax policies.

## Conclusions

Eradicating extreme poverty is a formidable challenge, but surveyors and other land professionals should see this as an opportunity to improve people's lives flexibly and urgently. The World Bank seeks to strengthen partnerships, especially at country level and with FIG, to improve land governance for development. With support, we are confident that extreme poverty will be eradicated by 2030, when FIG will be 152 years old. Our work must begin now. ●

## More information

> This article is a shortened version of the original that was published as an International Federation of Surveyors article of the month (September 2013; <http://bit.ly/byamugisha>). It is based on the author's book, *Securing Africa's land for shared prosperity*, published by the World Bank in July 2013 (<http://publications.worldbank.org/19810>)

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## Further +info

Related competencies include **T007, T057, T072**



RICS is implementing building information modelling at its London head office. In his third article following the project, **Les Pickford** looks at how the facilities management industry views the approach

# From potential to reality

**A**s with other parts of the construction industry, many facilities management (FM) teams are trying to get up to speed with building information modelling (BIM) and understand its practical implications – now and in the future. While the aims of collaboration, innovation and efficiency are not new to the FM profession, mapping these to a BIM environment can be a challenge.

On the RICS project, the model has been delivered and the team is developing ways to use and retrieve information, and is also working on a benefits realisation plan. RICS is preparing the business case to invest in the necessary IT kit – for use by the FM team, contractors/suppliers and for internal training – and is finalising the details around model ownership.

As part of the ongoing management of the building, RICS is planning some refurbishment work and, together with its property adviser CBRE, is looking to see what information can be gathered and added to the model.

## Identifying the benefits

RICS understands that it is on a learning journey with its project, but just how aware is the FM industry of BIM and its implications? The BIM4FM group – comprised of built environment institutes, trade associations and professional bodies including RICS, and supported by the Cabinet Office Government Property Unit) – recently published a survey of end users, owners and occupiers. Key findings include:

- 61% of respondents believed that BIM will help support the delivery of FM, with 35% being unsure
- 23% of respondents said their company was planning to use BIM in the future, but 63% were unsure whether any plans were in place.

It said the potential opportunities for FM included: life cycle management, early involvement in design and performance specification, cost reductions, improved efficiencies, carbon reductions and document management.

Many of these have been echoed by Paul Chidgey, RICS Head of Facilities, who has also identified these possible benefits:

- 3D imagery of the building and meeting room space for the RICS website to improve commercial sales
- reduced safety risk – 3D modelling can enhance the layout and positioning of various security systems and other devices in the building
- enhanced design performance: swift and accurate comparison of different design options for future building projects

- faster project delivery – speed up the design process and reduce the timescales of building projects
- virtual tours of the building to be used for briefing maintenance contractors (cleaning, mechanical and electrical, etc)
- 3D modelling to improve the way RICS manages and uses space in the building.

## Uncertainty remains

However, as is common with any new way of working, there are some concerns. The two main issues highlighted in the survey were around cost (initial investment and ongoing maintenance) and integration with current technology and computer-aided facility management (CAFM). Others included training, data management time, unknown technology and legal issues.

Going forward, the survey raises some important points, including:

- some uncertainty within the FM profession about how BIM will help deliver its services
- work is needed to demonstrate the real benefits of BIM, especially at handover and post-occupancy
- new ways of working need to be developed across the supply chain (indeed, the survey highlighted the concern that the BIM project supply chain might not be ready for closer working).

Speaking at the publication of the results, Geoff Prudence, Chairman of the BIM4FM group, said: “The survey clearly highlighted that facilities managers, owners and occupiers identified that BIM provides the potential and opportunities

for ‘better information management’. It was felt that this information will support ongoing performance improvements post-occupancy and handover.”

Based on the findings, the BIM4FM group has set itself a number of actions:

- creating consistent messages to explain the benefits of BIM
- increasing BIM knowledge, understanding and competence within its member organisations
- explaining that BIM is an enabler to improve the integration of FM into any construction project
- establishing how BIM can benefit the existing building stock and promote implementation.

The UK government has mandated Level 2 BIM (essentially, file-based collaboration and library management) from 2016. While this only applies to public sector projects, there are growing ‘push and pull’ forces within the wider construction supply chain to start using BIM, or at least understand what it means for parties. The BIM4FM survey shows that the potential benefits are enticing but, as we enter 2014, there is clearly a lot to do to turn them into reality. ●

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## Further +info

A copy of the BIM4FM survey can be found at [www.rics.org/bim](http://www.rics.org/bim)

The project team will be sharing its experiences through articles in the RICS professional journals, and regular updates on [www.rics.org/bim](http://www.rics.org/bim) and the RICS Building Information Modelling (BIM) LinkedIn discussion group

Related competencies include **T064, T066**





# Shale gas and the 'f' word

The controversial process of 'fracking' has frequently featured in the UK national media in recent months. As the battle lines between opposing positions are defined, it can be difficult to understand the real risks, which parts of the country might be affected and the likelihood of the technology actually being implemented. **Philip Santo** reports

The current debate around exploration for shale gas has focused on the hydraulic fracturing, or 'fracking', technology involved. Faced with the task of selling an already challenging concept to a sceptical public, oil and gas industry representatives must wish they had originally come up with a less aggressive sounding abbreviation for the process.

Local and national protest groups have been formed in response to possible environmental concerns, stimulated in part by two small earthquakes caused by fracking in Lancashire in 2011, following which operations were suspended. After a detailed investigation, the Department of Energy and Climate Change (DECC) issued a report in December 2012 (<http://bit.ly/onshorex>) and gave the all clear for exploration to continue, subject to additional controls. In July 2013, the Department for Communities and Local Government (DCLG) published *Planning practice guidance for onshore oil and gas* (see [bit.ly/UK\\_shale\\_gas](http://bit.ly/UK_shale_gas)).

In recognition that opposition protests were liable to become increasingly vociferous, the trade body representing the UK onshore oil and gas industry, the United Kingdom Onshore Operators Group, was relaunched at the end of 2012. At the end of February 2013 it published best practice guidelines for the exploration and appraisal phase of drilling for shale gas.

## What is fracking?

Conventional gas is usually found accumulated in sandstones or limestones, but shale gas is produced directly from the source rock in which organic matter was deposited and the gas flows much less freely. Extraction techniques are essentially the same, apart from the need to systematically fracture the shale to enable the gas to flow.

Hydraulic fracturing, or fracking, does not use explosives but fluid, usually water containing small amounts of additives, which is pumped into the rock at high pressure to create narrow fractures, kept open with sand, to provide paths for the gas to flow.

The minor earthquakes in Lancashire in 2011 followed the fracking process at an exploratory well, possibly when an existing fault was lubricated by the injected fluid. Earthquakes of local magnitude (ML) 3 occur naturally three to four times a year in the UK and only occasionally cause minor superficial damage. Those in Lancashire were at ML 2.3 and ML 1.5, which is insignificant in the scale of damaging earthquakes.

UK data indicates that damaging earthquakes – with magnitudes greater than ML 4.5 – tend to originate more than 10km deep, which is far below the depths at which fracking will take place. Indeed, it is claimed, with some justification, that dam construction imposes a much greater risk of inducing earthquakes due to the additional load imposed by the retained volume of water.

## New controls

The DECC report introduced new controls, close monitoring and a precautionary approach with a very low threshold of 0.5 ML magnitude. This is within the range of ground motion caused by vehicles and trains, and is smaller than the maximum ground motion regulated for other industrial and construction activities such as quarrying.

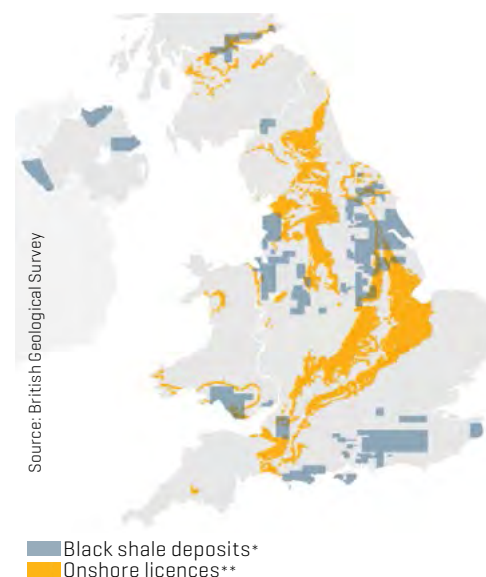
The DECC report acknowledges that fracking in the UK is a developing area of knowledge, making it clear that protocols may be modified to ensure that seismic risks are properly addressed and present no hazard to local communities. Concerns about contamination of groundwater by the process are similarly addressed.

The UK oil and gas industry has a good track record of working in the most sensitive locations, such as in Poole Harbour and along Dorset's Jurassic



Figure 1

Shale formations across the UK



\* Shale data for Northern Ireland not shown

\*\*given exclusive rights to exploration and drilling



Coast. In fact, there is little public awareness of just how many oil and gas production facilities have been established across the country in the past 50 years. There is inevitably some local disruption while the initial infrastructure is put in place, but once the exploration phase has passed and production starts there is little intrusion. Facilities are screened from view and are soon accepted by the local population. The DECC report states: *"There is no reason to expect that the current phase of exploration activities will have any adverse effect on property values in the vicinity of the activities."*

### A commercial venture

The UK government is not putting any money into the venture, so claims that resources are being diverted from sustainable energy initiatives can be easily dismissed. The geological potential for shale gas exploitation in the UK is definitely present across large areas of the

country (see map), but until drilling takes place the reality will remain unknown.

Even the most optimistic do not anticipate a repetition of the dramatic shale gas boom in the US, where exploitation has resulted in falls in the price of natural gas, but the British Geological Survey has confirmed that potential shale gas reserves are more than double original estimates. To encourage exploration, the government has announced major tax incentives for operators and, in an attempt to defuse local opposition, a package of benefits that include payments of £100,000 for communities near hydraulically fracked exploratory wells and 1% of revenues from every production site.

Meanwhile, activity on the ground eventually resumed during July 2013 at Balcombe in West Sussex. The understandable reservations of the local residents were promptly hijacked by 'professional' protesters whose hallmark guerrilla tactics and media nous seemed to catch the industry flat-footed, while their creative exploitation of legislative loopholes added further delays and uncertainty. Occasional ill-judged interventions from politicians have done the government few favours, but more rational contributions to the debate are now being made.

As with all oil and gas exploration, this is a commercial venture where the financial risks are high, but the rewards for success are unquestionable. The benefits of success extend far beyond the companies involved. An estimated 800 wells over a 16-year production period could create more than 5,000 full-time jobs and provide over £5bn a year in tax revenue, while a report from the Institute of Directors in May 2013 presented a scenario where shale gas production could attract investment of £3.7bn per year and support up to 74,000 jobs, often in regions with high unemployment. The nation will have an additional energy source and the government will gain some breathing space as it grapples with its energy policy.

The political and commercial imperatives are such that proponents of fracking can afford to take a long view. Despite the raised media profile and successful stalling tactics achieved by protestors at Balcombe, it does not take a cynic to realise that it will take an unusually well-organised protest movement to stand successfully in the way of the gathering momentum for shale gas exploration. ●

*This article is based on an article originally published in the April 2013 edition of the Legal & General Surveying Services: Technical News*

## Fracking in the EU

In October 2013, the European Parliament proposed that exploration and hydraulic fracturing extraction activities for non-conventional hydrocarbons should be subject to environmental impact studies, in adopting an amendment to existing EU legislation. Lead MEP Andrea Zanon was granted a mandate, by 332 votes to 311 with 14 abstentions, to negotiate a first-reading agreement with EU ministers.

The Environmental Impact Assessment Directive applies to public and private projects, setting out certain criteria, including the information that must be submitted to national authorities for a project to be assessed for approval.

Current legislation covers natural gas projects that extract at least 500,000m<sup>3</sup> per day. Many shale gas projects yield less and hence are not subject to an impact assessment requirement. MEPs want this requirement to be mandatory, whatever the quantity extracted, for all exploration and exploitation of non-conventional hydrocarbons, including shale gas projects, for the phase in which the hydraulic fracturing technique is used.

The proposal includes measures aiming to prevent conflicts of interest between developers and people carrying out studies. For the full European Parliament press release, visit <http://bit.ly/eushaletest>.

Perhaps of more concern to advocates of fracking, in October, France's constitutional court upheld a ban on hydraulic fracturing, ruling that the law against the energy exploration technique is a valid means of protecting the environment.

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### Further +info

Related competencies include **T001, T028, T049, T051, T061**







# Data at your fingertips

Surveyors today have access to a wide range of online data tools that support planning, due-diligence and surveying processes. The key, however, is knowing where to find them. **Carole Ankers** presents a useful 'dataset top 10'

**W**hen it comes to researching the viability of new land and property developments, surveyors, architects and planners must gather extensive supporting data. This is now more accessible than ever; everything from environmental due diligence and geological data to historic planning information can be easily found online and incorporated into new projects, allowing more informed decisions to be made and potential issues to be highlighted early on in the process.

But the secret is to know not only what information is out there, but where, so that you do not spend vital time vainly trawling the internet or calling multiple local authorities or organisations. The following rundown is a snapshot of just some of the data available online that is widely used for feasibility studies, environmental impact reports, or as part of the wider planning application process.

## 1. Planning application data

It is no longer necessary to contact individual council offices for planning application data. Information is readily available online, making it easy to review past and present planning activity, to highlight potential planning issues and to generally provide valuable insight at the start of a project.

All applications submitted since 1997 have been collected from planning registers across Great Britain from local authority weekly planning lists. This data, available via services such as Promap or Envirocheck, also contains potential projects records that have been gathered from trade publications and tender requests.

By 2013, Landmark Information Group's database contained more than 7.8 million applications.

• [www.promap.co.uk/pro\\_mapping\\_current.php](http://www.promap.co.uk/pro_mapping_current.php)

• [www.envirocheck.co.uk/products/environmental/maps\\_historical](http://www.envirocheck.co.uk/products/environmental/maps_historical)

## 2. Listed buildings

According to English Heritage, there are more than 374,000 listed building entries, in addition to 28,105 scheduled ancient monuments, more than 2,026 registered historic parks and gardens, and 7,306 conservation areas, not to mention a number of registered historic battlefields, designated wrecks and World Heritage Sites.

There are three grades. Grade II buildings are considered of national importance and special interest; 93% of all listed buildings are in this class and it is the most likely listing grade for a homeowner. Grade II\* buildings are particularly important structures of more than special interest, and Grade I buildings are of 'exceptional interest', and sometimes considered to be internationally important.

In addition, further land-use constraint data is available that highlights nationally important archaeological sites, World Heritage Sites (of which there are 36 in the UK, including Stonehenge, Canterbury Cathedral and Hadrian's Wall). Historic Parks, gardens and designated landscape datasets are available that provide boundary data, in addition to 43 historically significant battlefield sites. This data is now fully available to access online.

• [www.english-heritage.org.uk/professional](http://www.english-heritage.org.uk/professional)

• [www.promap.co.uk/pro\\_mapping\\_historical.php](http://www.promap.co.uk/pro_mapping_historical.php)

## 3. Public rights of way

Another popular dataset concerns public rights of way, because these can potentially create restrictions from a planning or development point of view. The data is derived from

the 'Public Rights of Way' and 'Other Public Access' sections of Ordnance Survey Explorer Maps. These have been taken from local authority definitive maps and any later amendments.

As rights of way are not always clearly defined and are liable to change, it is important to check with the relevant local authority for the latest information.

• [www.ordnancesurvey.co.uk/shop/?products/paper-maps](http://www.ordnancesurvey.co.uk/shop/?products/paper-maps)

#### 4. Local development plans

To identify protected areas or determine any land use constraints in an area, land use policies are collected from local authorities throughout Great Britain. With local authorities required to prepare planning strategies for their areas in accordance to current town and country planning acts, this data is readily available. Within the plans are detailed policies, produced by district councils, unitary councils and National Park authorities, to guide future development in the local authority areas. Such plans may include detailed proposals for individual sites, and identify areas suitable for housing, industry, community or social facilities, retail, transport, conservation or other land uses.

• [www.planningportal.gov.uk/planning/planningsystem/localplans](http://www.planningportal.gov.uk/planning/planningsystem/localplans)

#### 5. Land use constraints

For areas deemed to be of natural importance, restrictions are in place that may limit the extent and type of property development allowed. This could be anything from the land being designated as within an Area of Outstanding Natural Beauty or Special Area of Conservation, to national nature reserves or country parks. A recent addition is the ability to search for 'areas of wildland character', which specifically cover Scotland and indicate areas of 'high wilderness'.

Knowing the type and location of these designated areas is therefore important during the planning process.

Data is available from Natural England, Scottish Natural Heritage, Countryside Council for Wales, English Heritage and Historic Scotland, in addition to central online resources such as Promap or Envirocheck, which not only provide the data in a range of formats, but save having to contact individual suppliers directly.

• <http://labs.promap.co.uk/view>

• [www.envirocheck.co.uk/products/environmental/envirocheck\\_report](http://www.envirocheck.co.uk/products/environmental/envirocheck_report)

#### 6. Green belt

With green belt areas being protected, understanding the boundaries and extent of protection is key when working on any proposed developments where this could be a consideration. Green belt data, derived from local authority local plans, can be supplied as digital files that can be brought directly into existing computer-aided design or geographic information systems for use. Envirocheck provides comprehensive environmental reports, incorporating green belt data.

• [www.envirocheck.co.uk/products/planning/green\\_belt\\_constraints](http://www.envirocheck.co.uk/products/planning/green_belt_constraints)



#### 7. Coal mines

Risks can arise from past coal mining activities, and The Coal Authority is responsible for dealing with public safety related to any potential damage as a result. Coal mining searches available from the authority are of considerable use to anyone planning a development or project on any land located within a coal mining area in Britain.

The Coal Authority holds and maintains the national coal mining database and so the mining reports provide an accurate analysis of specific addresses or sites across England, Scotland and Wales.

• <http://coal.decc.gov.uk>

#### 8. Flood risk

The Environment Agency reports that more than five million properties in England and Wales are at risk of flooding from river, sea, surface or ground water. As well as providing a flood advice line and online warnings, the agency provides guidance on flood risk as part of the planning and development process. It does not, however, provide information on ground or surface water flooding, which is available from flood risk specialists.

• [www.argyllenvironmental.com](http://www.argyllenvironmental.com)

• [www.sitecheck.co.uk/Flood.do?articleId=45631](http://www.sitecheck.co.uk/Flood.do?articleId=45631)

• [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

#### 9. 'Price paid' data

The Land Registry provides access to comprehensive historic 'price paid' data and other associated information related to a property's transaction history. It has more than 17 million definitive records. Available data includes full property addresses, the price paid for the property, date of transfer, the property type (i.e. whether it is detached, semi-detached, terraced, etc.), whether it is a new build, plus if it is considered freehold or leasehold.

• [www.landregistry.gov.uk/market-trend-data/public-data/price-paid-data#sthash.Ulwe5Xfi.dpuf](http://www.landregistry.gov.uk/market-trend-data/public-data/price-paid-data#sthash.Ulwe5Xfi.dpuf)

#### 10. Agricultural land classification

The agricultural land classification forms part of the planning system in England and Wales. It categorises agricultural land into five categories, depending on its versatility and suitability for growing crops. Both Natural England and the Ministry of Agriculture, Fisheries and Food provide guidance and mapping datasets for this.

• [www.naturalengland.org.uk/](http://www.naturalengland.org.uk/)

• <http://archive.defra.gov.uk/foodfarm/landmanage/land-use/documents/alc-guidelines-1988.pdf>

#### More information

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Visit <http://bit.ly/cpdday> for details on scheduled RICS CPD days, from £135. Upcoming events include London (12 December 2013), Kent (Ashford, 30 January 2014) and Scotland (Perth, 27 February 2014).

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Further +info

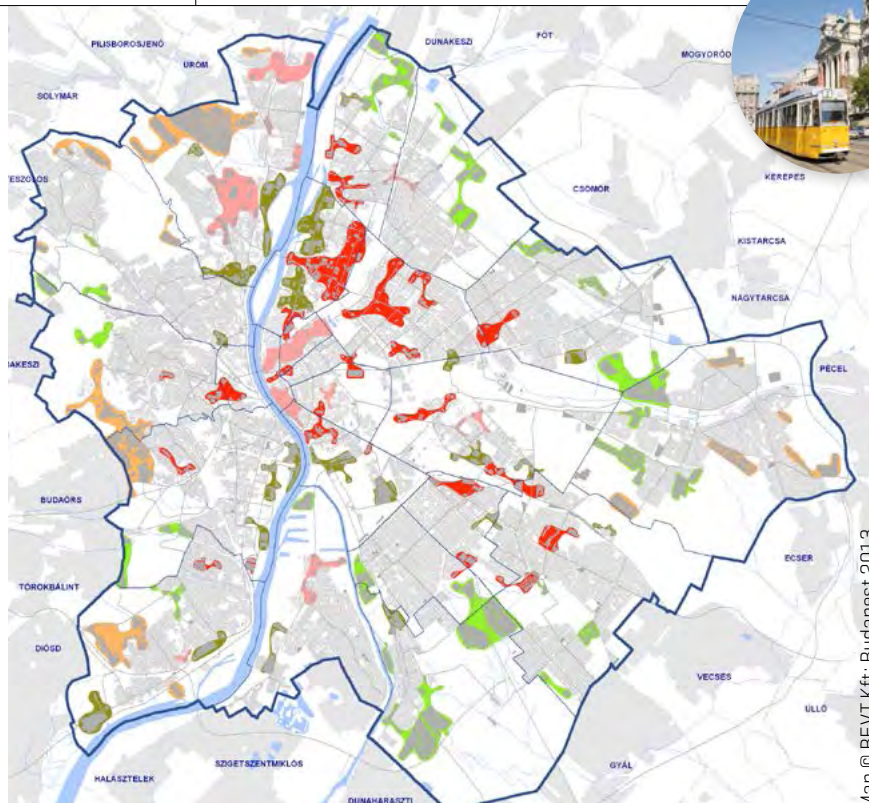
Related competencies  
include T007, T052,  
T056, T061, T083,  
M009







Despite its move towards a market economy since 1989, Hungary's planning system approach and tools have not changed much since the 'command economy' period, explains **Gábor Soóki-Tóth**



Map © BEVT Kft; Budapest 2013

# A paradigm shift?

Since the fall of the iron curtain in 1989-90, the former Soviet-dominated countries of central and eastern Europe have taken a path of transition from a centrally planned to a market economy. But despite the inevitable changes in these countries, the legacy of the past can still be traced today.

The planning system has evolved relatively intact, despite the move to more market-based conditions over the past 20 years. But while there have been efforts to create strategic urban governance and management structures, the newly established autonomy of local governments has led to a power imbalance between public authorities and private developers.

This is partly because of the imbalance between the costs of former state responsibilities taken over by local governments, together with an asset base that requires funding for operations, instead of making a contribution to cover the costs of operations and public services. The top-down and, in essence, 'modernist' planning system, a legacy of the command economy and rigidly focusing on 'urban form' and functional purity, has not been helpful in assisting the development of a new type of partnership between developers, the authorities and the community at large.

## Early legislation

Planning was a central paradigm of the socialist economies of central and eastern Europe from 1945 to 1990, under the political influence (and military domination) of the Soviet Union. In Hungary, the paradigm and instruments of spatial planning (both on urban and regional level) had a longer institutional history than the socialist state because the Hungarians were early adapters of the 'master plan' as a regulatory framework for guiding urban development.

The first legislation requiring cities to prepare structure and zoning plans were enacted in the late 19th century, and a modern 'planning act' was introduced in 1937 and later modified in 1964. 'Socialist planning', although fundamentally different from 'capitalist' town planning in its orientation, used the same planning and control instruments. A two-tier planning system of master plan and local zoning plans was introduced by the 1937 act: a comprehensive 'general' plan under strict ministerial control and a 'detailed' plan for areas where development was adopted and facilitated by the local legislative board. These planning instruments remained in use under the centrally planned model.

The first post-war master plan for Budapest was adopted in 1960. To fit in with the annual and five-year economic plans, its horizon was set at 10 years. The difference between the planned and the

## Spatial changes (restructuring) in Budapest since 1993. Only developments within the city border are shown

**Red:** Major restructuring within the existing built-up fabric of the city [typically change of use of former inner-city industrial areas, railyards and function changes in the historic city centre areas [lighter colour]].  
**Dark green:** reurbanisation of brownfields  
**Light green:** greenfield new developments  
**Brown:** urbanisation of former suburban gardens and green areas [mainly converted into housing]

market approach was that while in the pre-Second World War period the master plan served as a guidance of private investment, the socialist master plan was a blueprint for public investment under strict central government control, because urban development was financed from redistributed central state budget resources.

## New initiatives

The two most important regulatory initiatives that set a new framework for urban development at the time of the political transition during the early 1990s were privatisation and local autonomy. Privatisation transferred the supply of real estate from the public to the private sector; local autonomy gave settlements the power to regulate land use decisions.

The tension between the top-down approach of the inherited planning paradigm and the often conflicting demands of the market is reflected in the fundamental difference between how the private sector (developers) and public planning authorities view the best

exploitation of individual sites or entire neighbourhoods. Neither has the planning system devised any testing of viability as part of preparing regulatory or conceptual development plans, nor does the public administration have the necessary skills to evaluate issues regarding economic feasibility aspects.

The map shows the spatial changes the market has induced during the past 20 years: complete neighbourhoods have been rebuilt and densified, whereas many functions – due to restrictions imposed within the capital city of Budapest – have deserted the city. Similar to the greenfield developments in the peripheral districts, some of the villages have grown by an additional 25%-30%, or even 50% (not shown). Urban planning continues to focus on urban zones, whereas developers (and users) interpret the city as locations, with distinct functional and market potentials that can be interpreted as 'products'.

## Key laws

Currently, the 1997 Act LXXVIII on the Formation and Protection of the Built Environment and the 1996 Act on Regional Development and Regulatory Planning are the key legislation regulating urban development in Hungary. The master plan (called the 'structure plan'), and the local building ordinance (including the local regulatory plan), are the key urban planning instruments.



▲ A typical 1950s sculpture outside a now refurbished office building in Budapest

Image © Gábor Soóki-Tóth

## The role of RICS

RICS in Hungary is promoting a new, more transparent normative structure for the zoning agreement procedure. The key aim of the proposal is that legislation would clearly determine that costs covered by the private party should be related to the planning activity and the proposed development, to offset the costs of the external effects caused.

These rezoning efforts are one of the signs of the remaining tension between the top-down planning approach that views the city as a spatial-functional hierarchy regulated by zoning versus the market-oriented developer's focus on the highest and best use and the functional mix to achieve this at a particular urban location.

Zoning agreements may be a first step to establish a partnership arrangement between authorities, which gradually experiment with a new role as 'enablers', and private developers, which also need to better esteem the value of the historic urban fabric and structure.

The structure plan sets out the development potential and directions of the municipality, whereas the regulatory plan and the building ordinance are the binding legal documents on which building permit applications can be decided by the local building authorities. As a general rule, any building activities may take place on land assigned for development, on condition that these correspond with the zoning regulations. The precondition for granting a building permit is that the plot in question conforms to the standards set out by the local building ordinance and is accessible by vehicle from an adjacent public road.

Applying for a building permit is a routine process in Hungary and since the introduction of an online permit application documentation support system (<http://etdr.gov.hu>) in January 2013, a partly automated procedure. Building regulations are complex and authorities often leave room for interpretation. Solving such issues takes time but, in general, private sector developers see coping with planning hurdles as an easily manageable risk factor during development.

The exception is when the proposed development programme does not fit with local zoning requirements. In such cases, in the absence of a regulated process, the final compromise is reached through a 'political bargaining' procedure. The Act of Building Construction introduced the zoning agreement as an instrument to allow municipalities to transfer the cost of planning to the benefiting parties.

Because Hungarian municipalities, including Budapest, do not have in-house planning teams (municipal planning offices and the chief architect operate as a planning authority only), consultant planners (architectural offices with special licences to deliver regulatory plans and related documentation required by law) are contracted through a public tender process. On signing the zoning

agreement, the developer takes over all costs directly related to the preparation of planning documents.

In addition, because the brief definition included in the law allows for a wider interpretation, several items that otherwise would be the municipality's responsibility are required from the developer in return for the 'favour' of modifying the local plan.

Since municipalities are often short of cash, this method of getting surplus funds to cover budget deficits was already widely used prior to the amendment of the law. Zoning agreements cannot guarantee the outcome of a final council vote; however, the assumption is that if an agreement is reached and the developer makes the required commitments under contract, the decision shall be made accordingly. ●

## More information

> This article draws from *Real estate development in Eastern Europe, the case of post-socialist urban planning in Budapest, Hungary* by Áron Horváth, Pal Baross and Gábor Soóki-Tóth, to be published in the forthcoming book *International approaches to real estate development*, edited by Graham Squires and Erwin Heurkens <http://bit.ly/intappr>

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## Further +info

Related competencies include **T051, T061**





Surprisingly few surveyors are familiar with the opportunity to get legal advice directly from barristers. **Kirk Reynolds** seeks to demystify the process of instructing counsel



# Taking the direct route

When I started as a barrister nearly 40 years ago at Falcon Chambers, which specialises in property law and litigation, the Bar was notorious for its restrictive practices. Back then, Queen's Counsel could only appear in court if accompanied by a junior barrister (whether the workload justified it or not).

The Junior's fee was calculated as a fraction (sometimes as much as two thirds) of his Leader's fee and, above all, the only person who could instruct a barrister was a solicitor – not the client's agent (unless he/she was a solicitor), and not any other professionals acting for the client, such as surveyors or valuers, even if they were in charge of the whole case. Only a solicitor.

But the government and public rightly considered the system ripe for reform, and pressure was coming from clients and their professional (but non solicitor) advisers for direct access to the Bar in appropriate cases. These ideas were also enthusiastically received by barristers, particularly in chambers where a long tradition of acting in property cases had established strong bonds with land agents, valuers and building surveyors who were often effectively 'running' the case with much greater input than the solicitor.

So, in 1989, the Bar launched the then Direct Professional Access scheme, now known as Licensed Access, the idea being that all members of certain professional bodies, including RICS, should be 'licensed' to instruct barristers on behalf of clients without the need for solicitors to be involved.

So far as members of RICS were concerned, it was recognised that it would be helpful both for the barrister and for the instructing members to have guidance on how they should perform their new roles. Guidance notes were published, and chambers that took cases suitable for direct access by surveyors organised themselves in preparation for the new work. Barristers now have a *Licensed access guidance handbook for chambers*, published by the General Council of the Bar, incorporating Licensed Access Terms of Work and the Licensed Access Rules ([http://bit.ly/lic\\_acc](http://bit.ly/lic_acc)).

With almost 25 years' experience on the receiving end of instructions sent directly by RICS members, I have drawn three main conclusions:

**Surveyors are up to the job** My experience has been that, in the preparation of instructions asking me to advise, in writing, or orally in a conference (at which the client would often be present), surveyors have maintained a uniformly high standard. The essence of good instructions to Counsel is to explain the relevant context, the salient facts, the competing valuation arguments and the commercial consequences for the client.

A land agent who has lived with the property, a valuer who has been negotiating a rent review or a building surveyor who has prepared a Schedule of Dilapidations is going to be on top of that. The rest is just a matter of writing it down clearly in language that a barrister with a specialist property practice can understand, and including complete, legible copies of all relevant documents.

**Licensed access is under-used** My impression is that, even after a quarter century, some RICS members are reticent about instructing a barrister directly. There can be sound reasons, arising from the established client-solicitor relationship, to use the traditional route, and I would not suggest disturbing a well-settled pattern. But I strongly recommend that, in appropriate cases, surveyors ask themselves (and their clients) whether using a solicitor really adds value.

**Licensed access works better in some cases** A key point is what surveyors can and cannot expect from barristers – and, therefore, what part of a solicitor's traditional role they will have to perform. In basic terms, barristers can deal with the instructions and other material sent to them, help by advising whether additional points should be addressed or other information or documents sought, advise on the substance of the case and on procedural issues arising in an arbitration or independent determination, produce advice in writing or in conference (when it is often useful to have the client present, together with other advisers).

The barrister can appear (accompanied by the surveyor) at an arbitration or a meeting with an independent expert, but if court proceedings are needed, that part will have to be passed to a solicitor. The barrister has limited administrative support and will not correspond with the other side, carry out investigations (except purely legal research) or deal directly with witnesses or other

experts. All these things, which traditionally fall to the solicitor, must be done, in a licensed access case, by the instructing member. Therefore, licensed access works best in cases where advice is needed, which can be on the substance of the case, procedure or tactics, and which can be written or oral, or both. Once the case goes beyond that and involves a hearing (especially if expert evidence is to be given by the instructing surveyor himself), or other matters that are outside a surveyor's comfort zone, the burden on the surveyor can become unsustainable.

## The process

So how do surveyors go about embarking on their first instructions to a barrister? There are a number of stages:

Firstly, choose a barrister. Many surveyors will already know of suitable barristers, or at least suitable chambers. Alternatively, consult the Bar Council, which has lists of barristers and their fields of expertise. The kind of work surveyors are likely to be engaged in will often be done by barristers who are members of the Chancery Bar, so an obvious place to enquire might be the Chancery Bar Association ([www.chba.org.uk](http://www.chba.org.uk)) or the Property Bar Association ([www.propertybar.org.uk](http://www.propertybar.org.uk)).

Once you have chosen your barrister or chambers, contact the clerks, who would be happy to advise on availability, turnaround time and fees. Once these matters have been provisionally agreed and the client's approval obtained, the clerk will ask the surveyor to agree to the terms of work and other formal documents. Then submit instructions explaining the problem, with any necessary enclosures, to the barrister. It may be convenient to

ask them to call for a general chat once they have looked at the papers, which can be a good opportunity for the barrister to clarify instructions and request any further information or documents. The barrister will then deal with the instructions by a written opinion, or in conference, as requested.

Finally, when the work is completed, the clerk will send an invoice for the agreed fee. By instructing the barrister directly, a surveyor takes personal responsibility to discharge his fees. Bear this in mind when making financial arrangements with the client. ●

## More information

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The subject is dealt with at greater length in the various guidance notes and rules mentioned, and a useful treatment is to be found in the *Handbook of rent review*, Chapter 18 (Sweet & Maxwell).

RICS Neighbourhood Disputes and Expert Witness Seminars, January-March 2014 (<http://bit.ly/neiuit>)

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**Further +info**

Related competencies include **T003, T014, T051**



# Help for small firms

## RICS small business toolkit

Essential tools for managing your business and dealing with red tape.

To help members run their practice more efficiently in today's tough and challenging business environment we have launched the small business toolkit, which includes a series of practice management factsheets, guidance and services to support compliance with RICS regulations and a suite of tools to deal with statutory red tape.

Visit **[rics.org/smetoolkit](http://rics.org/smetoolkit)** to find out more





# A global challenge

An ambitious new project will map how shortages of resources such as land, food, water, fuel and minerals can affect the world's economy and social and political stability. **Aled Jones** explains

# S

Society operates with a fairly simple model of capital flows, based on providing the goods and services that people use. The current economic system behaves as a linear system with no limit to resources.

However, evidence shows that resource constraints will, at best, steadily increase energy and commodity prices over the next century and, at worse, create an uncertain and unstable economic paradigm. How resource constraints affect the economy is complex and depends on a number of factors.

The Global Resource Observatory (GRO) project, launched by the Global Sustainability Institute at Anglia Ruskin University, aims to accelerate thinking on governance and market responses to the consequences of resource constraints.

Scenario results will allow investigation into the implications of resource scarcity, international relationships and protocols on economic growth and future development that are critical to continued wellbeing and social prosperity.

## Background

In 1972, the Club of Rome published *Limits to growth* (See [More information](#)), using system dynamics theory to analyse the long-term causes and consequences of growth in the world's population and economy. The report's overall message was that a business-as-usual scenario would lead to global economic collapse around the middle of this century. Subsequent analysis has continued to support the general conclusions in the original report, and further work has shown the economic and political consequences of such limits.

The 2013 research report *Resource constraints: sharing a finite world. Implications of limits to growth for the actuarial profession* brought together the latest evidence on resource trends, exploring the potential impact on the global economy and the finance sector (and particularly on pensions and investment returns over the medium to long term) through the use of scenarios and actuarial modelling.

## Main objective

GRO has received seed funding of £300,000 from the Dawe Charitable Trust and is developing a model to quantify the possible interactions of the human economy with the planet's carrying capacity. Short-term scenarios of likely resource use will be created using an agent-based model approach. Moving from a system dynamics analysis, this new modelling framework will contribute understanding to the multidimensionality

and non-linearity of global resources insecurity, while highlighting the resources/human activity nexus.

The project's main objective is to investigate the effect of resource constraints on short-term GDP growth, and to provide policymakers with clear information on a range of scenarios in order to close the time-lag between governments' short-term agendas (usually five years) and the long-term vision of current models.

By exploring the links between countries, GRO will also be able to bring together social indicators with resource data to model potential political instability that may arise.

The project will produce the following:

- a new global database of national demand, supply and flow figures relevant to global resource security
- a global 'debt map' for resource availability, specifying for each UN country the current supply of resources that can be found within its borders compared to current consumption
- a world-scale system dynamics model to investigate the current interaction between resources and the economy
- an agent-based model to investigate possible future economic growth pathways.

## Database

The backbone of the GRO model is a newly developed database of variables recorded at both the global and national level, organised around six main groups of commodities: food, water, land, fuel, minerals and air, as well as key social and demographic indicators. The database

## FUEL

## MINERALS

## AIR

includes multidimensional (agricultural, socioeconomic, demographic, environmental, social cohesion), internationally validated, comparable, yearly updated (panel data from 1995 to now) variables collected for all the UN member countries.

### System dynamics model

GRO will include an open-source system dynamics model to quantify the possible short-term interactions of the human economy with the carrying capacity of the planet and key limited resources.

The model will enable exploration of the complex interconnections between the evolution of finite resources and the main development dimensions (demography, social cohesion, markets and prices, environmental loading, international politics and, indirectly, technology and innovation), and provide projections over the next five years. It will move forward from the Club of Rome World3 model to incorporate the latest data on climate change and the other planetary boundaries, and data on prices.

### Agent-based model

The agent-based model (ABM) will model short-term scenarios of policy decisions and their impact on national resource use and growth, in order to provide international governance recommendations, advance policy debate and generate ideas for multilateral governance improvements. We opted for an ABM approach to investigate the possible future economic growth pathways, because it proved to be the most effective at simulating social-economical-environmental systems. The ABM agents will be the world's countries, i.e. an agent for each UN member state.

### Outputs and dissemination

The GRO project team has discussed the implications of this type of modelling with a number of organisations, including Lloyd's of London, the Aldersgate Group, the Institute and Faculty of Actuaries, the

## The land link

Managing trade-offs between increasingly expensive resources is becoming ever more important. Should land be prioritised for food or energy production, biodiversity or infrastructure and who has priority of scarce resources, water in particular, in certain regions? Stakeholders involved in the management of these resources or ownership of land need to better understand the systems links between these issues and start to engage in strategic dialogue to ensure systemic risks are minimised.

World Bank and the University of Wisconsin. Outputs (through policy papers, workshops, academic publications and wider articles) will include:

- quantitative evidence of the most likely impact on the composition of GDP in the short-term, given resource trends
- qualitative evidence on possible political instability risks, mapped geographically
- recommendations for multilateral governance improvements and policies to promote growth and productivity where resources are limited.

### Conclusion

Some economists and market analysts argue that prices of resources increase as they get scarcer, or as they do more damage (if that damage is measured and priced), and that the market will therefore create solutions to resource scarcity. But there is increasing evidence that the current system, with its inputs, outputs and market imperfections (in particular the lag in time between pricing and impact, incomplete resource data and unaligned policy frameworks) means that scarce resources are not appropriately managed. Therefore, the project aims to:

- provide a comprehensive assessment of the resources available
- investigate the relationship between resources and global growth
- provide future scenarios according to the possible behaviours of UN countries
- highlight the need for a shift in the global development paradigm

- suggest possible short-term policies for the enhancement of resource conservation and to promote global 'green growth'.

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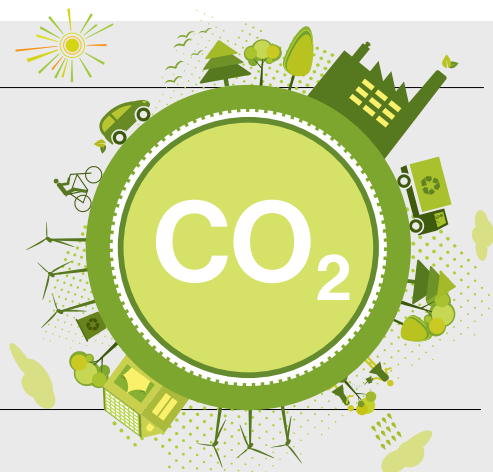
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### Further +info

Related competencies include **T057, T077, M009**







# Carbon uncaptured

Is carbon capture and storage (CCS) buried for good, or is there something out there that could economically resurrect it, asks **John Westwood**

**B**urning coal has long been recognised as a major source of pollution. In 1952, 12,000 people died as a direct result of the great smog that enveloped the UK's major cities, a situation addressed by the Clean Air Act 1956. At that time, the UK was producing about 700 million tonnes per annum (tpa) of coal.

Worldwide, there are huge reserves of coal and it is now the dominant fuel of the electricity generation. China, the largest user, burnt some 2.4 billion tonnes in 2012 – with dire consequences for carbon dioxide emissions. But its long-term use demands capture of these highly polluting emissions, which has been demonstrated at laboratory scale.

Despite this, in July 2013, Shell and SSE failed to secure EU funding for the Peterhead power station carbon capture and storage (CCS) project in Scotland. In 2007, previous plans had collapsed after BP withdrew from the £1bn venture.

Meanwhile, in the US, a \$4.7bn CCS project in Mississippi due to start up in 2014 reportedly has a \$1bn cost overrun. And in September 2013 it was announced that development of full-scale carbon dioxide capture at

Norway's Mongstad oil refinery had been discontinued following increasing costs and delays. At the same time, however, the new US Environmental Protection Agency published rules on emissions that will make it nearly impossible to build new coal-burning plants without fitting carbon capture technology. We are living in a world of mixed messages.

## Economic use?

In practice, is CCS priced out of the quest for low-carbon energy? In 2011, the UK Committee on Climate Change estimated that electricity generated by coal with CCS would cost twice that of natural gas without CCS and, in 2012, the US Energy Information Administration (EIA) reported similar numbers. So it seems that CCS is only viable with massive subsidies. But so too is offshore wind, an area where the UK is making huge investments. The other key issue is that an unsubsidised natural gas power plant emits less than half the CO<sub>2</sub> of a coal-fired plant. It is, therefore, no surprise that the UK government aims to replace old coal-fired stations with up to 30 new gas-fired plants by 2030, with the remainder of power generation needs coming from a mix of nuclear and renewables. So is CCS buried for good, or is there something out there that could economically resurrect it? For example, is there some economic use for this unwanted CO<sub>2</sub>?

One possibility is CO<sub>2</sub>-enhanced oil recovery (EOR), a proven technique for 'scrapping the barrel'. In most oilfields, 'primary recovery' often means that 90% of the oil remains in the ground. 'Secondary recovery' employs water and natural gas injection, displacing the oil and driving it to the surface, but still typically leaving 70% behind. Using CO<sub>2</sub> EOR, the carbon dioxide can either push through the reservoir, or mix with or dissolve in the oil, decreasing viscosity, increasing flow and boosting total recovery from approximately 30% to sometimes more than 60%.

It is reported that in 2010 some 129 CO<sub>2</sub>-EOR projects were operating around the world. In the US, there are about 114 active commercial projects, which together inject more than two billion cubic feet of CO<sub>2</sub> and produce more than 280,000 barrels of oil per day (bpd).

Much use is made of naturally occurring CO<sub>2</sub>, but one scheme is seeing CO<sub>2</sub> captured from an industrial plant in North Dakota delivered via a 328km pipeline to the Weyburn oil field in Saskatchewan, Canada. There, it is injected with the aim of adding another 25 years to the field life and flushing out as much as 130 million barrels of oil that might otherwise have been abandoned.

## UK scenario

Could it work in the UK? Oil production peaked in 1999 at 2.9 million bpd and then,

despite a few significant finds and great efforts to increase recovery, declined to 967 bpd in 2012. Carbon dioxide from coal-fired (and indeed natural gas-fired) power stations and other industrial plants could be transported by pipelines and injected into North Sea fields. One estimate made in 2004 by the US Department of Energy suggested that 15-30 billion barrels could be recovered from the entire North Sea, at today's oil price a value of \$1,500-\$3,000bn. Even if only a fraction of this is achievable, it could still be a huge prize.

This is not the complete alternative to purpose-designed CCS, but perhaps at least some CO<sub>2</sub> could be gainfully employed, and with economic benefit. In mid-October 2013, the *Financial Times* reported that "green policies will add 41% to [UK] electricity prices by 2030 according to the energy department's own forecasts". In such situations all options warrant examination. ●

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**Further info**

Related competencies include **T058**, **T084**, **M009**



# Opening up options

**Gary Strong** describes some of the initiatives that aim to raise awareness among young people of the opportunities offered by the surveying profession

**E**ducation is an important consideration for RICS. It is the lifeblood for future membership and the progression of existing members. A professional body ignores it at its peril, which is why we have a dedicated Education and Qualification Standards team for the UK and a Global team supporting our various standards boards.

Proactively demonstrating in schools and colleges that surveying is a great career choice can only inspire the next generation, so I am delighted that RICS matrices ([www.rics.org/matrices](http://www.rics.org/matrices)) is now leading a strategy to engage with secondary schools, using inspirational case studies and other material ([www.rics.org/surveying2014](http://www.rics.org/surveying2014)). Chartered Surveyor status constitutes a passport to international travel, and there are more than 175 surveying specialisms within RICS. It is estimated that around 27% of RICS members are based overseas, in more than 130 countries. See the RICS official video for schools (<http://bit.ly/schpre>).

## University Technical Colleges

RICS has been leading the way through its involvement in the University Technical Colleges (UTCs), established around the UK for the 14-19 age group. Promoted by the Baker-Dearing Trust, founded by Lord Baker, the initiative has government support and some of the Engineering UTCs are already up and running. The number has increased to 45, and 15 will be Construction UTCs, with an expected element of geomatics, planning, development, environment and rural issues in the curriculum.

RICS' input into the curriculum will help students understand that the construction industry needs not simply lead to them becoming bricklayers and plasterers, but that technology such as building information modelling and that used by land surveyors will enable them to progress to careers in project management, land surveying, planning and development, environmental surveying and more.

RICS has also been involved in the industry-wide Advisory Committee for 14-19 Construction and Built Environment Education. Chaired by Roy Seddon MBE of Seddon Construction, this committee will address land, property and built environment education issues. It includes representatives from the Construction Industry Training Board (CITB), colleges, universities, employers, RICS and the Chartered Institute of Building. We have had meetings with the Department for Education (DfE), and have contributed to recent developments in vocational education and training, and associated qualifications policy.

Reforms will take place in two stages. By September 2016, qualifications that meet the requirements in full will be awarded. Beyond this, there is also the proposed technical baccalaureate measure. RICS is using its dialogue with DfE to persuade policy makers about changes that need to be made across all sectors.

## Youth development

RICS has also contributed to consultations on the development of proposed core 14-19 standards for construction and built environment (CBE) education, supporting students thinking of moving into land, property or construction. There is positive support for continuing the three themes, for establishing credit to apprenticeships, and the kitemarking of standards. Class of Your Own has developed a new Design Engineer

Construct! curriculum to encourage the study of, and careers in, the built environment and engineering. Its own survey showed that 71% of young people thought a career in construction meant being a builder or bricklayer, so there is some way to go in getting the message across ([www.classofyourown.com](http://www.classofyourown.com)).

City & Guilds is making available an extended project qualification from September 2014, and the principal learning qualification in CBE became available in September 2013. Training pathways are also in development: level 2 BTEC is going forward for accreditation; a couple of the UTCs are working towards BTEC First diplomas delivery; supporting apprenticeship and higher apprenticeship frameworks remains a priority; national vocational qualifications (NVQs) are being updated.

International Vocational Qualifications (WJEC) Level 1 and 2 awards in Construction and the Built Environment focus on applied learning for 14- to 19-year-olds. These awards will be available from September 2014. Each qualification will involve 120 guided learning hours. Three awards will be available: designing the built environment; constructing the built environment; planning sustainable communities.

The Chartered Surveyors Training Trust (CSTT) independent charity supports young people struggling to start their surveying careers. RICS works with CSTT via an apprenticeship scheme that counts towards AssocRICS membership. The Advanced Apprenticeship in Surveying helps gain qualifications such as Level 3 NVQ Diploma in Surveying, Property and Maintenance BTEC, and Level 3 Diploma in Surveying. Candidates are eligible for AssocRICS assessment once they have completed the apprenticeship and two years' work experience.

RICS once ran its own examinations in tandem with RICS-accredited degrees. With university fees increases, many may see a decline in undergraduate entrants; indeed, some already have. Degree-only entry to the profession at chartered level may therefore not remain sustainable, but this should not be detrimental to the profession itself. There is no reason why future, non-graduate entrants should not prove successful at achieving chartered status.

## Future intake

Without lowering AssocRICS or MRICS entry standards, how will young people attending UTCs or colleges and aspiring to surveying careers progress to becoming chartered? It is a challenge to face up to, while protecting the gold standard of our qualifications globally. We must recognise non-degree qualifications and further training that enables potential surveyors to believe they can, in time, achieve RICS chartered status. ●

## More information

> For details on the University Technical Colleges, visit: [www.education.gov.uk/schools/leadership/typesofschoools/technical](http://www.education.gov.uk/schools/leadership/typesofschoools/technical)

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